Change of direction demands in german high-performance soccer

Deutsch, J., Rieke, M., Rein, R., Held, S., Donath, L.

Institute for Exercise Training und Sport Informatics

INTRODUCTION:
This study aimed to compare the change of direction (COD) demands of German Bundesliga soccer match play relative to playing position using an optical-tracking-system. COD data were collected from German Bundesliga soccer teams (2017–2018 season; 17 matches). The findings of this study would give further insights into soccer match play demands and could therefore influence load management, physical training and rehabilitation process of soccer practitioners.

METHODS:
An event in which a player completed a deceleration (-2 m s^{-2}), an angular change in the direction of motion ($20°$), and a subsequent acceleration (2 m s^{-2}) within a duration of 1 second was defined as a COD. These thresholds have typically been used to classify accelerations and decelerations above a moderate intensity level during a team sports match (Delves et al., 2021; Newans et al., 2019). Directional changes were subdivided by entry velocity (<3.0 m s^{-1} (COD3), 3.0-5.5 m s^{-1} (COD3_5.5), 5.5-7.0 m s^{-1} (COD5.5_7) and >7.0 m s^{-1} (COD7)) and rotation angle (Low: 20-59° (COD60); Medium: 60-119° (COD120); and High: 120-180° (COD180)). The frequency of total COD, the subcategories of entry velocity and rotation angle for each playing position (Goalkeeper (GK), Centre Back (CB), Full Back (FB), Central Midfield (CM), Winger (WI) and Striker (ST)) and the average, standard deviation, maximum and minimum values were calculated.

RESULTS:
ANOVA revealed significant group effects for COD60 ($p<0.001$; $²= 0.08$), COD120 ($p<0.001$; $²= 0.63$), COD180, ($p<0.001$; $²= 0.05$) between positions. Post hoc tests revealed significant differences between positions for all angles. Further, ANOVA revealed significant group effects for COD3 ($p<0.001$; $²= 0.07$), COD3_5.5 ($p<0.001$; $²= 0.20$), COD5.5_7 ($p<0.001$; $²= 0.14$) and COD7 ($p=0.034$; $²= 0.02$). Post hoc test revealed significant differences for all entry velocities, except COD7. Approximately, 90% of COD during matches were performed with entry speeds <5.5 m s^{-1} and about 70% were low (~40%) and moderate (~30%) angled turns.

CONCLUSION:
This study provides insights into the COD demands of German Bundesliga soccer matches, which can be used to guide position-specific physical preparation strategies, to monitor player load, to develop performance tests and to give recommendations for rehab and return to play standards.

REFERENCES:
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